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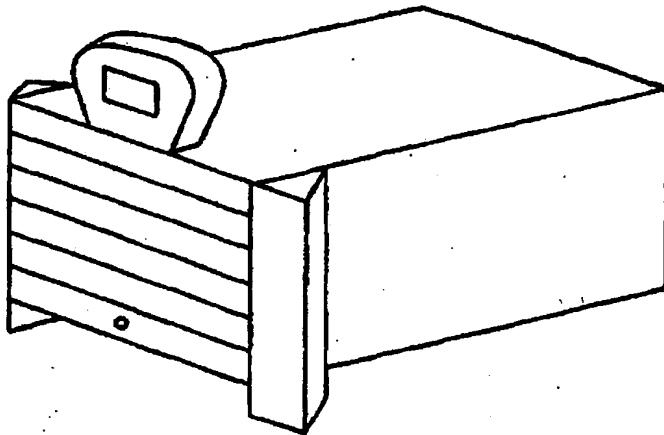
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(54) Title: EXPANDABLE MULTI MEDIA TERMINAL UNIT

(57) Abstract

An Expandable Multi Media Terminal Unit with more than one module including a Basic module and at least one Extension Module, wherein the housing of the modules are substantially similar in their shape. The modules are electrical and mechanical in connection by plug-connectors.

**BASIC MODULE**

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EXPANDABLE MULTI MEDIA TERMINAL UNIT

The invention relates to an Expandable Multi Media Terminal Unit with more than one module and in particular it relates to an Expandable Multi Media Terminal Unit which is capable to connect different modules to one homogeneous home communication system.

In the present multi media universe a lot of units with a new standard arrive on the market: Video CDs, Euro ISDN, Digital TV, etc. The problems rising by the questions, which unit can process what signals, which system will become the standard in which area, which units harmonize with one another are known for the user. Often it is missed a link between consumer electronic, communications and computer technologies.

In addition one has the problem, that the future multi media units need not to be compatible to a present control unit in their electrical- and mechanical connections.

As an expandable multi medial terminal unit it is known to connect separate media units by cables. These electrical connections comprise a plurality of cables representing a cable confusion which is not easy to understand from a man not skilled in the art.

Further the different units are often not mechanical compatible which requires special housings in which these units are disposed.

Moreover it is necessary to install a separate software for the operation of the different units.

In view of this it is an object of the invention to provide an Expandable Multi Media Terminal Unit, in which the mechanical and electrical connection of different units are improved and less complicated.

An Expandable Multi Media Terminal Unit achieving the above-noted object is characterized in claim 1, whereas the subclaims characterize advantageous embodiments of this invention.

The Expandable Multi Media Terminal Unit according to the invention provides the features required to convert separate multimedia units into one homogenous home communication system.

The invention provides an Expandable Multi Media Terminal Unit being capable to connect different and autonomous Extension modules to a Basic module. Possible Extension modules for this Expandable Multi Media Terminal Unit are mass storage and I/O unit, expansion slot unit, 2 ISA slots, digital satellite receiver extension, HiFi extensions as tuner extension with RDS, writable CD extensions, MPEG-compressor extension, VOD-decoder extensions, and digital audio broadcast tuner extensions.

The invention also represents the opportunity to connect Extension modules containing multimedia standard and application of the future to the Basic module.

The Expandable Multi Media Terminal Unit according to the invention comprises a Basic module and Extension modules which can be connected to each other in each combination and any order by means of plug connectors.

A Basic module being designed to function as a intelligent control unit for current and future multimedia applications includes an universal CD player which will manage different type of digital disc for TV and Hifi applications as for music, phones, photographs, also karaoke songs, encyclopaedias and DOS- and Windows-based games.

The Basic module comprises further an operator means, a power supply and a CPU-Board. The CPU-Board comprises a CPU, Memory means and a VGA. The control processor unit can be of the type INTEL which allows a degree of DOS compatibility to play DOS and Windows-based computer games.

The memory means can contain a RAM with 4 MB in socket. It is possible to expand the memory up to 32 MB with a SIMM-Module.

The VGA as the video section can be a Cirrus 5425-TV VGA controller with 512 KB.

An improved mechanical connection between the different modules is realized by three profiles allowing an approximate guide of the modules. It is necessary to provide a more exact guidance for the electrical plug connection. Therefore, different guide elements are disposed directly to the plug connectors. This mechanical concept allows to connect Extension modules in any number.

The electrical connection between the different Extension modules and the Base unit is handled by a digital and analogous bus. With a plug connection one can connect the new Extension modules. The plug connectors can be for example of the type DIN 41612. The digital bus is compatible to an ISA-bus and uses an 96-polar plug connector of the type C. The analogous bus transmits the audio and

video signals and uses an 48-polar plug connector of the type ½ C. Since the distance of these two buses being the analogous and digital bus is relatively long, there arises no influence to the analogous signals. Sweep radiation of the signals with high frequency portions to the analogous bus (for example synchronisation signals) are screened by additional earth wires.

At the bottom side of the Basic modules and the Extension modules spring contact stripes (sockets) are employed and at the top side of the Extension modules terminated stripes (plugs) are employed.

As already mentioned this concept allows a combination of different Extension modules. In each Extension module there is a ROM that communicates with the Base module via an I/O port. Each ROM contains the code which is needed for the Base module to communicate with the Extension module, e.g. to control an amplifier Extension module etc. Thus, each Extension module is operable immediately after it was connected. An external software installation is not necessary.

It follows a brief description of the drawings:

Fig. 1 is a perspective view showing the housing of the Basic module of the Expandable Multi Media Terminal Unit according to the invention.

Fig. 2 is a perspective view showing the principle of the housing of one Extension module.

Fig. 3 is a the panel view of a combination of the Basic module and two Extension modules according to the invention.

Fig. 4 is a side view of the combination of the Basic module and two Extension modules according to the invention.

Fig 5 is a schematic block diagram showing the means needed for detecting and registering each Extension unit/Extension module by the Basic unit/Basic module.

A preferred embodiment of the Expandable Multi Media Terminal Unit according to the invention will be particularly described with reference to the accompanied drawings.

Figure 1 represents the housing of the Basic module.

As illustrated in figure 2 - 4 the Expandable Multi Media Terminal Unit according to the invention contains the Basic module and any Extension modules which are connected by a digital and an analogous bus and the mechanical connection basing on the profiles shown in particular in figure 2. The uncomplicated stackable concept is possible by using first two separated buses being the digital and the analogous bus, second the mechanical profiles being capable to connect the different modules with the needed precision by means of three profiles shown in figure 2 and third the plug connectors with guide elements which are used for the bus systems.

As shown in figure 3 on the top of the Base unit a display with keys as an operation means is disposed in order to monitor the operation of the Expandable Multi Media Terminal Unit, wherein the display can be of the typ LCD.

In the Expandable Multi Media Terminal Unit according to the invention the Extension modules themselves provide the software needed for the operation of the Extension module. Each Extension module is ready to work immediately after the Extension module is connected. The software is stored in memory means as a ROM in each Extension module. During the initialisation procedure by the Basic module a BIOS of the Expandable Multi Media Terminal Unit scans the ROM's, respectively. If an Extension module is detected, the software being stored in the ROM of the Extension module is loaded automatically. A graphical user interface represents these functions. Therefore no external software installation is necessary.

With regard to figure 5 different means for detecting and registering each connected Extension module/unit are shown in a block diagram. The separate means in combination with their function will be described now:

1. A BIOS for checking which Extension modules are connected.
Each non WIN 95 plug and play extension has an internal ROM.
There is stored the manufacture code, the manufacture unit number, the revision and data which are needed for a graphical user interface (driver, bit map for display ...).
2. The BIOS registers the extensions which were detected.
3. After booting the graphical user interface (GUI) will be started.
This GUI is for looking in the BIOS which Extension modules/components were detected.
4. The first time when a new Extension module is connected, the GUI reads necessary data for controlling these Extension modules from the ROM.

First GUI had to compare the extensions/components which BIOS had detected with an GUI initilisation file.

5. In addition GUI is for storing data from ROM on a hard disc of the Basic module.
6. GUI also registers new extensions in the GUI initilisation file.
Thus, each Extension module starts to work immediately after it was plugged in.
A software installation is not necessary. The needed software is stored in a ROM of each Extension module.
Alternatively the software of the Extension modules can be stored in a Flash-ROM or an EEPROM. The software regulating also the display of the operator means as well as the keys of the operator means can be updated any time.

The Basic module can be provided with an integrated modem, whereby the Expandable Multi Media Terminal Unit can be used as an answering machine, a facsimile and all online services which are on the market. It is also possible to use this modem to update the software. Enclosed it is possible to practice electronic cash in case of updates with charge by inputting the credit number.

The housing of the Basic module has one connector on the top. It carries the complete ISA bus and an analogous system bus for expansion purposes.

Using this connector, „slices“ are available which contain e.g. a sloppy disc/hard disc unit or an expansion slot unit. They may be stacked on top of the main unit as options. Each of these units feeds the bus through to provide stacking capabilities for more „slices“. This way allows an easy user upgrade path without using any tools.

The Expandable Multi Media Terminal Unit can be used in combination with an infrared remote control (infrared keyboard is optional) and by means of the graphical user interface one can operate the Expandable Multi Media Terminal Unit with a distance between the operator and the unit without any specific PC knowledge needed.

CLAIMS

1. Expandable Multi Media Terminal Unit with a modular arrangement including a Basic module and at least one Extension module, wherein the housing of the modules are substantially even in their shape and the modules can be electrical and mechanical connected by plug connectors.
2. Expandable Multi Media Terminal Unit in accordance with claim 1, further comprising guide elements being disposed directly to the plug connectors.
3. Expandable Multi Media Terminal Unit in accordance with claim 1 or 2, wherein the electrical connection comprises an analogous bus and a digital bus, which are spaced apart from each other, whereby the digital bus is compatible to an ISA-bus and the analogous-bus transmit the audio and video signals.
4. Expandable Multi Media Terminal Unit in accordance with claims 1 - 3, further comprising: spring contact stripes and terminal stripes, which electrical connect the bottom sides of the Basic modules and of the Extension modules with the top sides of the Extension modules.
5. Expandable Multi Media Terminal Unit in accordance with claims 1 - 4, wherein each module is provided with a storing means (ROM), in which the software being necessary for the operation of the module respectively is stored.
6. Expandable Multi Media Terminal Unit in accordance with claims 1 further comprising:
BIOS for checking which Extension modules are connected and for registering the Extension modules which were detected;
means for starting a graphical user interface;

graphical user interface for looking in the BIOS which Extension modules are connected and for reading necessary data for controlling the Extension module from the ROM, in case of the first time when a new extension is connected and for comparing the Extension modules detected by the BIOS; said graphical user interface for storing data from ROM on a hard disc of the Basic module by the graphical user interface; and means for registering new Extension modules in a graphical user interface initialisation file.

1/4

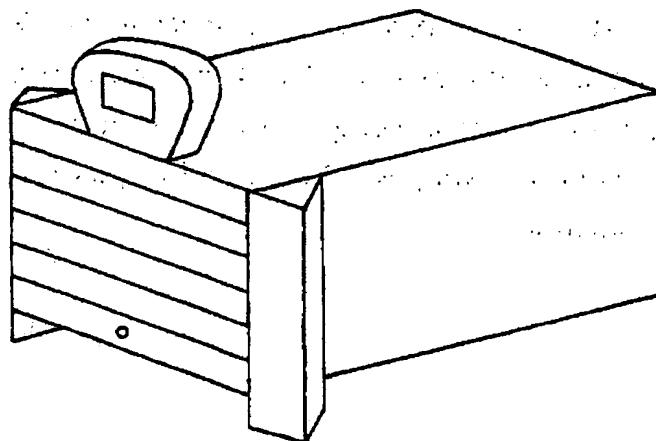


FIG.1 BASIC MODULE

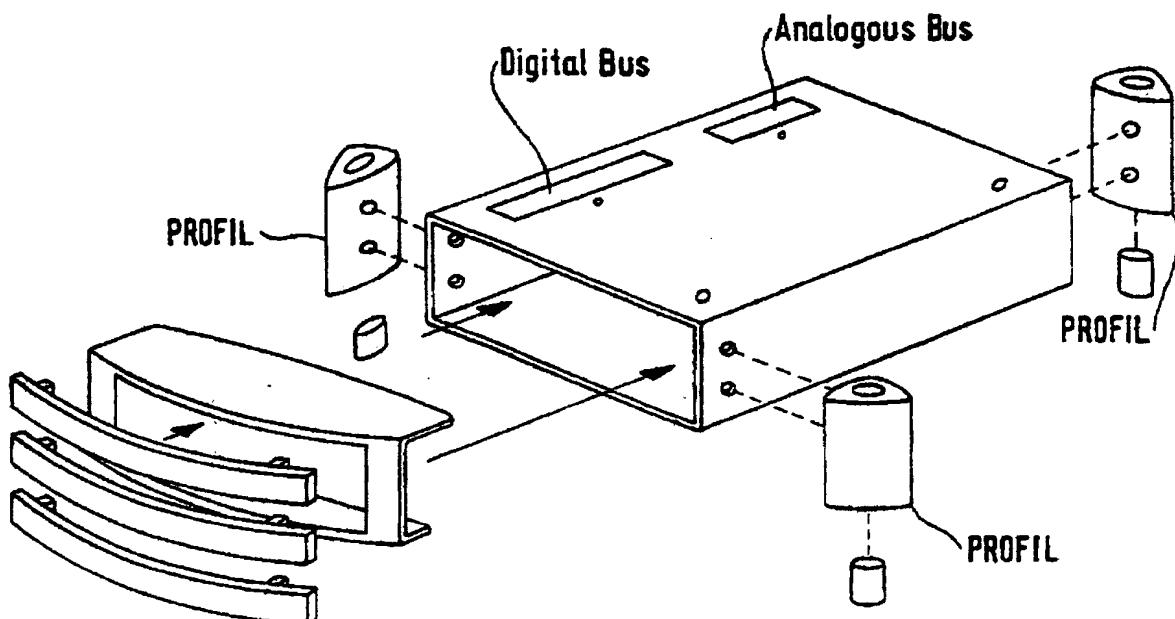


FIG.2 EXTENSION MODULE

2/4

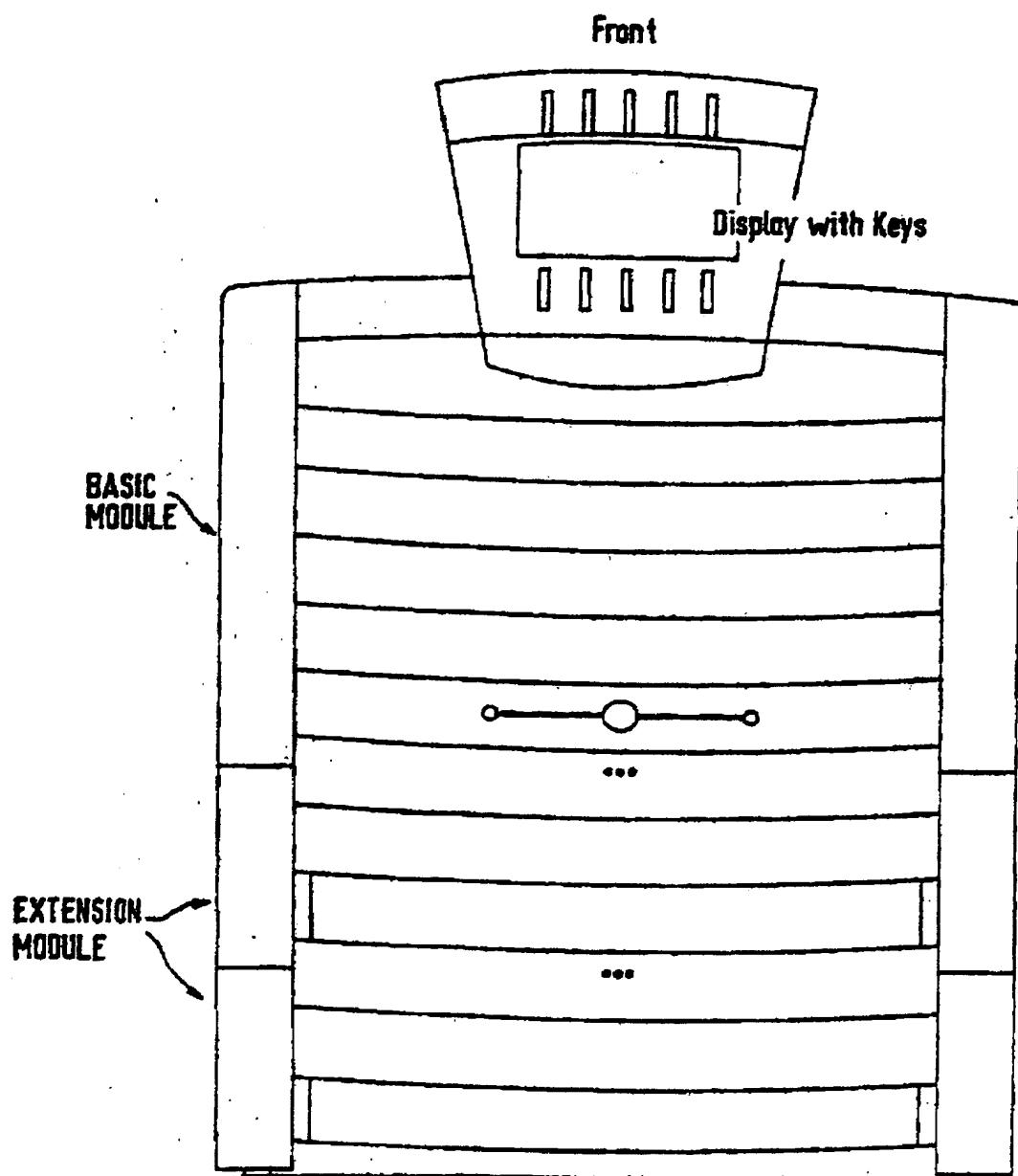


FIG.3

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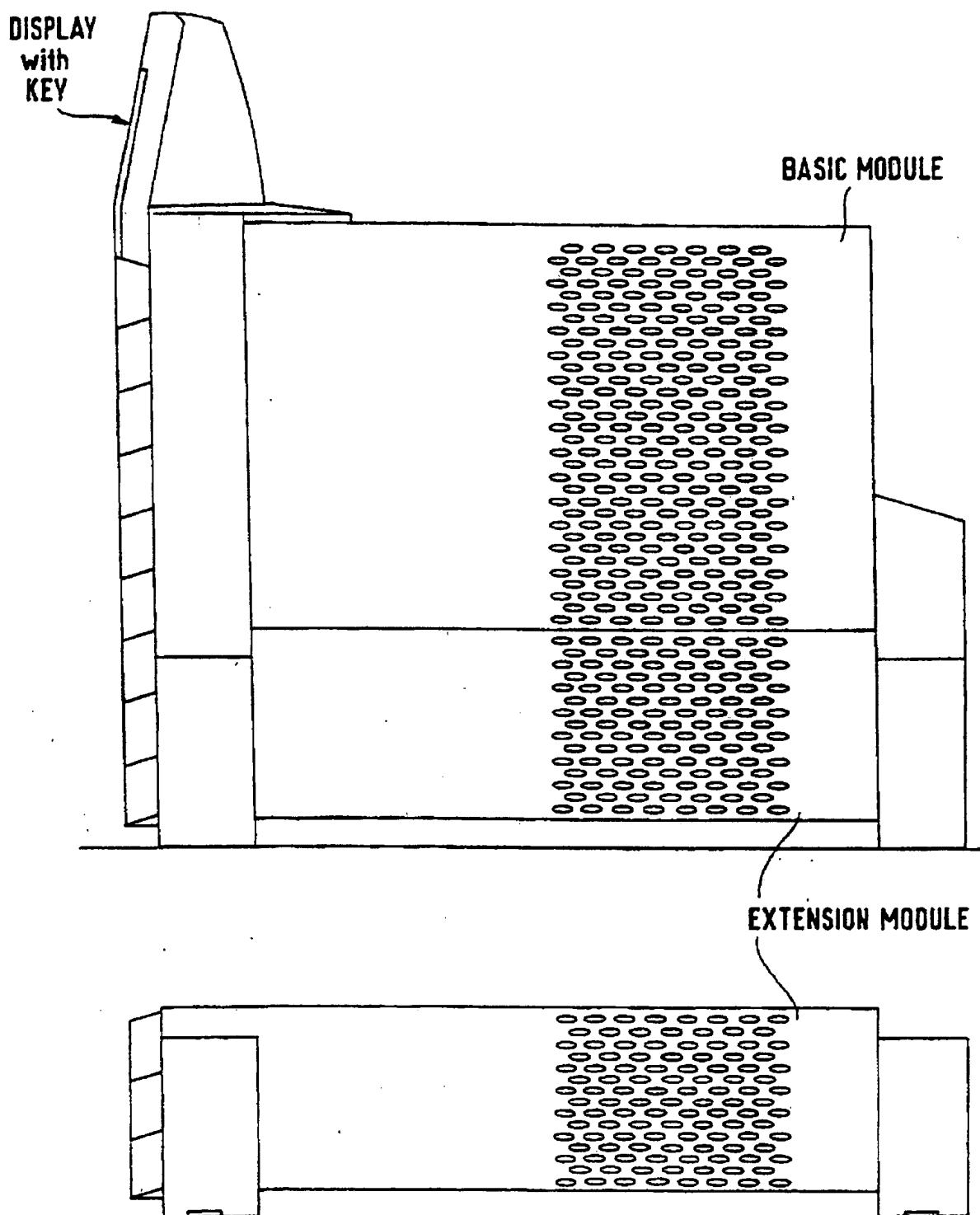


FIG. 4

4/4

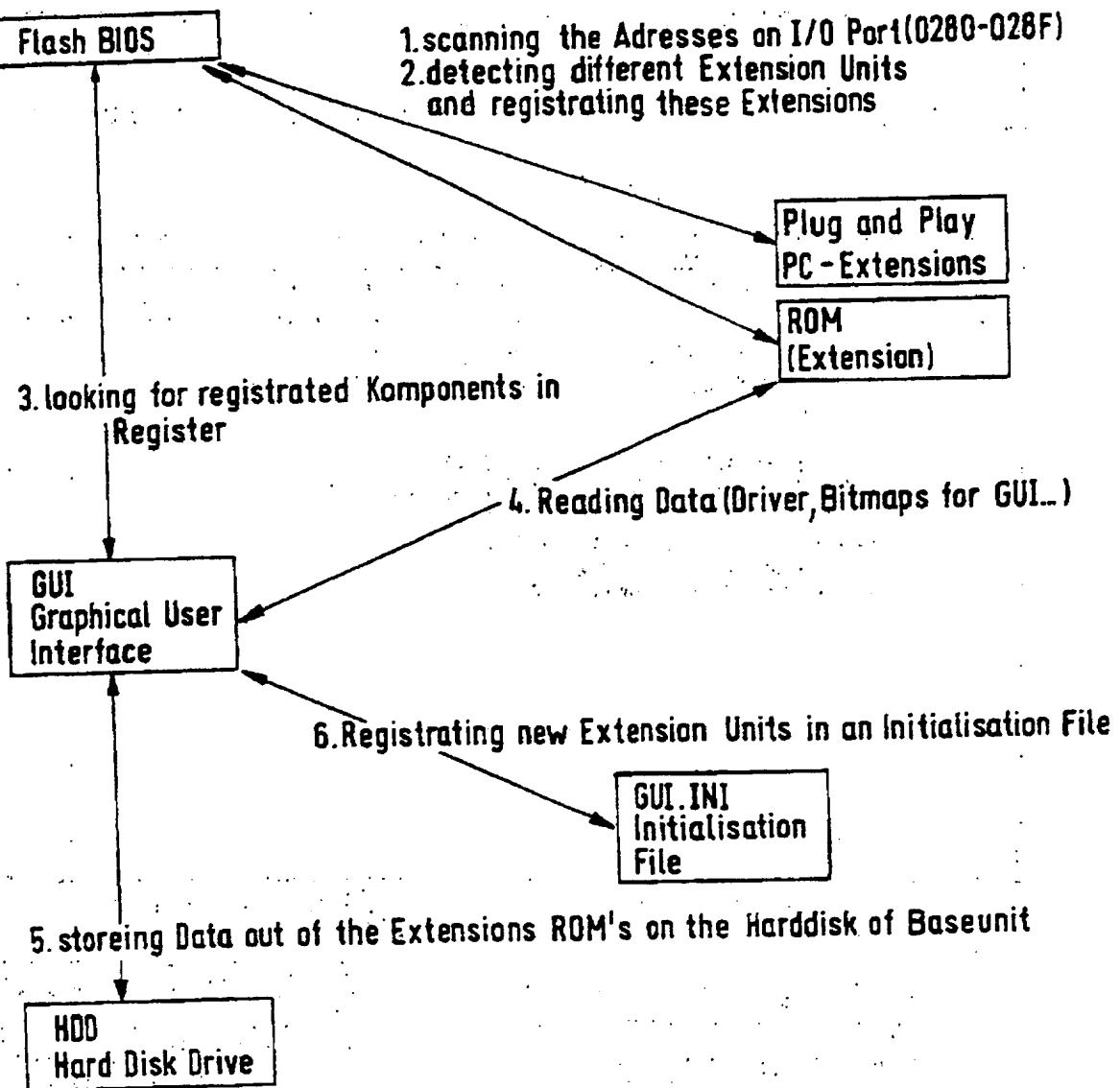


FIG. 5

INTERNATIONAL SEARCH REPORT

Internat'l Application No

PCT/EP '96/02982

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 G11B33/12

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 G11B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US,A,5 253 133 (GU0) 12 October 1993 see column 2, line 36 - column 3, line 15; figures 1,5 ---	1
X	IBM TECHNICAL DISCLOSURE BULLETIN, vol. 28, no. 6, November 1985, NEW YORK US, pages 2346-2347, XP002015127 "Stackable unit packaging concept" see page 2346 - page 2347 -----	1

 Further documents are listed in the continuation of box C. Patent family members are listed in annex.

* Special categories of cited documents:

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1

Date of the actual completion of the international search

Date of mailing of the international search report

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Information on patent family members

Intern. Appl. Application No.
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US-A-5253133	12-18-93	NONE	

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